



Sheet 1 of 2

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE  
MATERIAL INFORMATION STATEMENT  
(Use several sheets if necessary)ATTY. DOCKET NO.  
MIT5981/8124SERIAL NO.  
07/983,367APPLICANT  
Ramnath Sasisekharan, et al.FILING DATE  
November 30, 1992GROUP  
1808

## U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	IF APPROPRIATE	FILING DATE
dkw	AA	4,373,023	02-08-83	Langer, et al.		435	02	
	AB	4,338,401		Cremonesi				
	AC	4,795,703		Folkman, et al.				
	AD	4,885,207		Johnson, et al.				
dkw	AE	4,341,869	07-27-83	Langer, et al.		435	232	
	AF	4,373,023		Langer, et al.				
	AG	4,847,338		Unhardt, et al.				
	AH	4,401,758		Lormeau, et al.				
	AI	5,013,724		Petitou, et al.				
	AJ							
	AK							

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	AL	3108486	Japan				
	AM						
	AN						
	AO						
	AP						

## OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AR	Lindhardt, R. J., <i>Chem. Ind.</i> 2, 45-50 (1991)
AS	Casu, B., <i>Adv. Carbohydr. Chem. Biochem.</i> 43, 51-134 (1985)
AT	Lindhardt, R. J., et al., <i>Biol. Chem.</i> 267, 2380-2387 (1992)

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Deborah K. Kline

DATE CONSIDERED

03-04-94

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Sheet 2 of 8

FORM PTO-1449

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## OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

	AR	Lindahl, U., et al., <i>Trends Biochem. Sci.</i> 11, 221-225 (1986)
	AS	Lindahl, U., et al., <i>J. Biol. Chem.</i> 255, 5094-5100 (1980)
	AT	Lindahl, U., and Kiellen, L., <i>The Biology of Extracellular Matrix Proteoglycans</i> (Wight, T.N., and Mecham R., eds) pp. 59-104. Academic Press, New York)
	AR	Linhardt, R.J., et al., <i>Biochem. J.</i> 254, 781-787 (1988)
	AS	Linhardt, R.J., et al., <i>Biochemistry</i> 29, 2611-2617 (1990)
	AT	Linhardt, R.J., et al., <i>Biol. Chem.</i> 267, 2380-2387 (1992)
	AR	Linhardt, et al., <i>Biochem. J.</i> 254, 781-787 (1988)
	AS	Loganathan, D., et al., <i>Biochemistry</i> 29, 4362-4368 (1990)
	AT	Linhardt, R.J., et al., <i>Appl. Biochem. Biotech.</i> 12, 135-176 (1986)
	AR	Linker, A., and Hoyvingh, P., <i>J. Biol. Chem.</i> 240, 3724-3728 (1965)
dk	AS	Hoyvingh, P. and Linker, A., "The Enzymatic Degradation of Heparin and Heparitin Sulfate." <i>J. Biol. Chem.</i> 245, 6170-6175 (1970)
1	AT	Dietrich, G.P., et al., <i>J. Biol. Chem.</i> 248, 6408-6415
	AR	Silva, M.E., et al., <i>Biochem. Biophys. Acta</i> 437, 129-141 (1976)
dk	AS	Yang, V.C., et al., "Purification and Characterization of Heparinase from <i>Flavobacterium heparinum</i> ." <i>J. Biol. Chem.</i> 260, 1849-1857 (February 1985)
	AT	Gallier, P.M., et al., <i>Eur. J. Appl. Microbiol. Biotechnol.</i> 15, 252-257 (1982)

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Delvach K. Ware

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Sheet 3 of 8

FORM PT

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OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AR	Rice, K.G., and Linhardt, R.J., <i>Carbohydr. Res.</i> 190, 219-233 (1989)
AS	Saviers, A.A., et al., <i>Appl. Environ. Microbiol.</i> 33, 319-322 (1977)
AT	Nakamura, T., et al., "Purification and Properties of Bacteroides Heparinolyticus Heparinase (Heparin Lyase) EC 4.2.2.7." <i>J. Clin. Microbiol.</i> 26, 1070-1071 (1988)
AR	Bohmer, L.H., et al., <i>J. Biol. Chem.</i> 265, 13609-13617 (1990)
AS	Yoshida, K., et al., <i>Annual Symposium of Glycoconjugates</i> (1989)
AT	Dietrich, C.P., <i>Biochem. Biophys. Res. Commun.</i> 56, 985-972 (1974)
AR	Michelacci, Y.M., and Dietrich, C.P., <i>Biochem. Biophys. Res. Commun.</i> 56, 973-980 (1974)
AS	Ototani, N., and Yosizawa, Z., <i>J. Biochem. (Tokyo)</i> 84, 1005-1008 (1978)
AT	Ototani, N., and Yosizawa, Z., <i>Carbohydr. Res.</i> 70, 295-308 (1979)
AR	Ototani, N., et al., "Purification of Heparinase and Heparitinase by Affinity Chromatography on Glycosaminoglycan-Bound AH-Sepharose 4B," <i>Carbohydr. Res.</i> 88, 291-303 (1981)
AS	Ototani, N., and Yosizawa, Z., <i>Proceedings of the 6th International Symposium on Glycoconjugates</i> , pp. 411-412, September 20-25, Tokyo, Japan Scientific Press, Tokyo
AT	Dietrich, C.P., and Nader, H.B., <i>Biochem. Biophys. Acta</i> 343, 34-44 (1974)
AR	Dietrich, C.P., et al., <i>Biochem. Biophys. Acta</i> 237, 430-441 (1971)
AS	Nader, H.B., et al., <i>J. Biol. Chem.</i> 265, 16807-16813 (1990)
AT	Moffatt, C.F., et al., <i>Eur. J. Biochem.</i> 197, 449-459 (1991)

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<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div>           U.S. DEPARTMENT OF COMMERCE            PATENT AND TRADEMARK OFFICE  <b>MATERIAL INFORMATION STATEMENT</b>  <small>(Use several sheets if necessary)</small> </div> </div>		Sheet <u>4</u> of <u>9</u>
FORM PTO-1349		ATTY. DOCKET NO. MITS981/6124
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		APPLICANT Ramnath Sasisekharan, et al.
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OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
AR	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	McLean, M.W., et al., <i>Proceedings of the 8th International Symposium on Glycoconjugates</i> , pp. 73-74, September, Houston, Paeger Publishers, New York (1975)
AS	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	McLean, M.W., et al., <i>Eur. J. Biochem.</i> 145, 607-615 (1954)
AT	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Linhardt, et al., "An Immobilized Microbial Heparinase for Blood Desheparinization," <i>Appl. Biochem. Biotech.</i> 9, 41-56 (1984)
AR	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Yang, V.C., et al., <i>Appl. Biochem. Biotech.</i> 18, 35-50 (1987)
AS	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Yoshida, K., <i>International Symposium on Heparin and Related Polysaccharides</i> , September 1-6, 1991 Uppsala, Sweden
AT	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Kanwar, Y.S. and Farquhar, M.G., (1979)
AR	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Linhardt, R.J., et al., <i>Proc. Natl. Acad. Sci. USA</i> 76, 1303-1307 (1990)
AS	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Linhardt, R.J., et al., <i>Biochem. J.</i> 254, 781-787 (1988)
AT	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Marchant, Z.M., et al., <i>Biochem. J.</i> 229, 369-377 (1986)
AR	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Turnbull, J.E., and Gallagher, J.L., <i>Biochem. J.</i> 251, 597-608 (1988)
AS	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Linhardt, R.J., et al., <i>J. Biol. Chem.</i> 257, 7310-7313 (1982)
AT	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	C.G. Gebelein (Ed.), <i>Biomimetic Polymers</i> (pp. 135-173), New York: Plenum Press
AR	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Sharath, M.D., et al., <i>Immunopharmacology</i> 9, 73-80 (1985)
AS	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Rice, K.G., and Linhardt, R.J., <i>Carbohydr. Res.</i> 190, 219-233 (1989)
AT	<div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Bradford, M.M., <i>Anal. Biochem.</i> 72, 248-254 (1976)
EXAMINER <span style="float: right;"><i>Donald K. Ware</i></span>		DATE CONSIDERED <span style="float: right;"><i>03-04-94</i></span>
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Sheet 6 of 8

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	AR	<del>Payza, A.N., and Korn, E.D., <i>Nature</i> 177, 88-89 (1956)</del>
	AS	<del>Zimmermann, J.J., et al., <i>Appl. Biochem. Biotech.</i> 30, 137-148 (1991)</del>
dkw	AT	<del>Galliber, P.M., et al., "Heparinase Production by <i>Flavobacterium Heparinum</i>," <i>Appl. Environ. Microbiol.</i> 41, 360-365 (1981)</del>
	AR	<del>Panyim, S., and Chalkley, R., <i>Arch. Biochem. Biophys.</i> 130, 337-346 (1969)</del>
	AS	<del>Lauer, H.H., and McManigill, D., <i>Anal. Chem.</i> 58, 166-170 (1986)</del>
	AT	<del>Sasisekharan, R., Ph.D. thesis, Cloning and Biochemical Characterization of Heparinase from <i>Flavobacterium heparinum</i>, Harvard University (1991)</del>
	AR	<del>Cohen D. M., and Linhardt, R.J., <i>Biopolymers</i> 30, 733-741 (1990)</del>
	AS	<del>Warnick, C.T., and Linker, A., <i>Biochemistry</i> 11, 568-572 (1972)</del>
	AT	<del>McLean, M.W., et al., <i>Eur. J. Biochem.</i> 145, 607-615 (1984)</del>
	AR	<del>Al-Hakim, A., and Linhardt, R.J., <i>Electrophoresis</i> 11, 23-28 (1990)</del>
dkw	AS	<del>Deutscher, M.P. (ed.) "Guide to Protein Purification," <i>Methods in Enzymology</i> 182, 603-613, 738-751</del>
dkw	AT	<del>Berger, S., et al., "Guide to Molecular Cloning Techniques," <i>Methods in Enzymology</i> 152, 393-399, 415-423, 432-447 (1987)</del>
dkw	AR	<del>Cerbasi, E.C., et al., "Sulfur Regulation of Heparinase and Sulfatases in <i>Flavobacterium heparinum</i>," <i>Appl. Environ. Microbiol.</i> 51, 640-646 (March 1988)</del>
dkw	AS	<del>Belavsky, A., et al., "PCR-based cDNA library construction: general cDNA libraries at the level of a few cells," 17, 2919-2932 (April 1989)</del>
dkw	AT	<del>Yoshizawa, et al., A 79,107,55; (Japan) 23 August 1973 CA91:209379d</del>

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OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)							
dkw	AR		Bernstein, H., "A System for Heparin Removal," Ph.D. Dissertation, Massachusetts Institute of Technology (1985)				
dkw	AS		Cham, S.E., et al., "Scale-Up of Protein Isolation," W. B. Jakoby, ed., <i>Methods in Enzymology</i> 22, 478-490 (Academic Press, New York 1971)				
	AT		Comfort, A.R., et al., "The Influence of Bond Chemistry on Immobilized Enzyme Systems for Ex Vivo Use," <i>Biotechnology and Bioengineering</i> 32, 554-563 (August 1988)				
	AR		Klein, M.D., et al., "Heparinase: In Vivo Activity and Immunogenicity in Rabbits," <i>J. Lab. Clin. Med.</i> 102(5), 828-837 (November 1983)				
dkw	AS		Langer, R., et al., "An Enzymatic System for Removing Heparin in Extracorporeal Therapy," <i>Science</i> 217, 261-263 (July 1982)				
	AT		Langer, R., et al., "In Vivo Activity of Microbial Heparinase," <i>Trans. Am. Soc. Artif. Intern. Organs</i> 28, 387-390 (1982)				
dkw	AR		Linhardt, R.J., et al., "Immuno-Affinity Purification of Heparinase," <i>Int. J. Biochem.</i> 17(11), 1179-1183 (1985)				
dkw	AS		Linker, A., et al., "Heparinase and Heparitinase from Flavobacteria," V. Ginsburg, ed., <i>Methods in Enzymology</i> 28, 902-911 (Academic Press, New York 1972)				
	AT		Pitney, W.R., et al., "Control of Heparin Therapy," <i>British Medical Journal</i> 4, 139-141 (October 1970)				
dkw	AR		Silva, M.E., et al., "Isolation and Partial Characterization of Three Induced Enzymes from <i>Flavobacterium heparinum</i> Involved in the Degradation of Heparin and Heparitin Sulfates," <i>Biochemical and Biophysical Research Communications</i> 56(4), 965-972 (1974)				
dkw	AS		Yang, V., et al., "Removal of the Anticoagulant Activities of the Low Molecular Weight Heparin Fractions and Fragments with Flavobacterial Heparinase," <i>Thrombosis Research</i> 44(5), 599-610				
dkw	AT		Stecher, et al., Ed., <i>The Merck Index, Eighth Ed.</i> , 879 (1968)				
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